



The plains of Expedition Range: near dusk

METAMORPHOSIS

AUSTRALIA

Magazine of the Butterfly & Other Invertebrates Club

ISSUE NO: 83

DATE: DECEMBER 2016

Price \$6.00

ISSN: 1839-9819

<http://www.boic.org.au>

PLANNING AND ORGANIZING COMMITTEE 2016

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PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

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Membership fees are \$30 for individuals, schools and organizations.

AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st

June issue – May 1st

September issue – August 1st

December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

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COVER PAINTING

The plains of Expedition Range: near dusk – Painting by Andrew Atkins



AND NOW FOR SOMETHING COMPLETELY DIFFERENT

WORDS FROM THE VICE PRESIDENT

I hope everyone has been enjoying the invertebrate delights that this hot weather brings! No doubt many of you in south-east Queensland would have witnessed the amazing abundance of Caper Whites recently undergoing their migration (see *In the Garden* on page 43 for some photographs of these lovely butterflies).

We have some important announcements and requests of our members. Firstly, the position of club President is now vacant as Frank Jordan has resigned due to a change in personal circumstances. We thank Frank for his role as President and call for nominations for this position. The position of Secretary is also available and is an important role in the club. Please register your interest if you feel you could make a worthwhile contribution.

Secondly, I urge members who would like to become more involved in the club to consider submitting articles for the magazine, and/or attending our quarterly 'committee and planning meetings'. This is a great way to find out more about the club, meet other members, and contribute ideas. Our club has evolved significantly over the years and we couldn't have continued and produced such a wonderful magazine without the dedication and hard work of our members. However, members come and go and sometimes we get stuck... fresh ideas are always welcome and keep the club and magazine relevant and stimulating!

We welcome magazine articles of various shapes and sizes - from detailed technical or scientific reports, to simply a photo of an interesting bug from your garden asking "What is this?" A lot of knowledge of host plants and invertebrate distribution data can come about this way. PhDs or scientific training are not prerequisites 😊.

Please remember that our club is run by members for members, and we can't do this without you!

Finally, as members of my insect-loving family like to say during the festive season, "Merry Chrysalis!"

Alisha

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A Special Ridge – Andrew Atkins

*'Unthinking, you drift into a memory landscape of deeply living activity: all about the song and colour of nature; boundless micro-stories of survival, instinct and passion'.
Anon.*

Everyone experiences those rushes of blood, racing heartbeats and the unhidden joy when exploring new landscapes; just a touch of apprehension bound with inquisitiveness, perhaps brashness; an explorer's motivation - a naturalist's excitement. Memories abound, but for me, those most indelible are the collecting days at Blackdown Tableland, Central Queensland: the sun's spreading intensity, harsh bush calls, weary walks amid a sometimes hostile understory, but beautifully challenging. Add the wildlife, the early summer storms, remoteness - and azure butterflies spinning in the sky.

Warm early morning thermals lofted the Cessna easily to 3,000 metres. This was early 1970, and, as part of Australian Broadcasting, Rockhampton Queensland (ABRQ-9) film production unit, we were heading to Emerald to do a 'doco' on quarter horses. Just under the forty-minute flight a majestic sloping arrowhead of highlands appeared to the south. The pilot leaned across "Expedition Range - sandstone country, discovered by Ludwig Leichhardt in 1847" he said. Now soaring above the highest northern tip, a pale creamy-orange steep ridge of cliffs, cut by narrow, violet gorges breached above a surrounding ocean of blue-grey brigalow woodland. An instant moment of recall: those past, productive 'sand stone' field trips to the Grampians and the Blue Mountains to the distant south. This range looks butterfly-friendly!

Filming done (there was no video-tape in those days), we returned in the late haze. The pilot generously banked the aircraft to reveal below a rusty railway line, and parallel to this, a glistening (with broken wind-screen crystals) Capricorn Highway fringed with dust columns. Just south of Dingo and Bluff, a small sandy track traced its way through dry-sclerophyll forests and forked toward a lonely grazing settlement with rustic farmhouse. The right hand fork probed west, shyly disappearing between the zigzags of foothills.

Back home at Rockhampton the maps confirmed that this frail track, indeed, was the way to the summit of the sandstone ridge. Further research revealed that the range itself consisted of three converging mountain ridges, the Dawson (eastern side), Expedition and Shotover (on the western flank). They rise roughly south to north toward the Tropic of Capricorn reaching a northern 900-metre plus high plateau ('Blackdown Tableland'), its precipitous western slopes draining into the Comet River, and part of the vast Fitzroy River catchments. Beyond Duaringa and not far south along the Dawson Range, towards the aboriginal settlement of Woorabinda, the maps revealed Coomooloolaroo, a property that had been acquired in the late 1800's





Plate 1



by George Barnard and family from Tasmania. His educational directive was that his two sons and a daughter should study the wildlife of the district. In 1891 the English collector, A.S. Meek, visited the Barnard family on an extended ('apprenticeship') working stay, prior to his notable trip to New Guinea. My friend 'Zooie' (J.C.) Le Souëf knew this country well; in his younger jackaroo days he had mustered cattle in and beyond the property. Today some of the winter holding-yard posts still stand near the camping ground at Blackdown.

A quick packed lunch, a bottle of 'sars' and I was away on the 22nd November, 1970, then braving an exploratory path (by a less than powerful two-wheel drive Toyota), along the Capricorn Highway, and towards those mysterious western peaks. In those years bitumen was scant, and the graded road (sometimes single-lane) was no easy a trip to Emerald. The turn-off (at 100 miles in the old scale) was reached. Turning left, and then along 5 kilometres of rippled 'Clearview' track, bumping and jolting down to the right fork, and then into two dry creek dips lined with *Cyperus* sedge.

Through the brigalow woodlands a dazzling flash of Red-winged Parrots, then beyond in the open scrub, two dingoes emerged pacing the car, but more intent on running down a lazy Bustard. Here were groups of *Terminalia* shrubs, stripped of foliage by the restless caterpillars of that ancient skipper-butterfly, the Migratory Awl (*Badamia exclamationis*), and Orange Migrants (*Catopsilia scylla*) were already on the move (Pl. 1). Now, another 10 more kilometres of ochre dust, then finally the sloping scree and massive sentinel blocks of sandstone; Expedition Range. Wow!

Sculptured with potholes, the track ascended, gently circled, and then abruptly narrowed, just squeezing through the pink rock-chasms and cabbage palms. Here were sloping corridors of *Scleria* sedges, daisies, *Acacia* and *Boronia* bushes. Further along the trail worn carriage-wheel rut-marks (a remnant of the Cobb & Co Emerald-bound mail coaches) carved across rough flagstones. The surrounds were tumbled and scarred with breakaways. Now beneath a strengthening morning sun, stood blanched clusters of Lemon-scented gums and Zig-zag wattles, the knurled feet of *Angophora* were scattered with many flowering heath plants. In eroded swales between large boulders of sandstone abounded large grass tussocks of *Triodia*; I had reached Blackdown plateau.

Mild warming sunshine attracted many insects to Ti-tree and Grass Tree flowers. Skippers were common; some (particularly females) feeding on nectar, their mates had already begun to hilltop, resting near the highest edge of a looming western escarpment. They included four related brown sedge-skippers (*Hesperilla*), one of which was new to me (a fifth species was found later in the foothill soaks). Each species favored different resting sites, which they protected from intruders. Some were fighting each other and attacking other insect or bird intruders. At noon a lull in insect activity, and by mid-afternoon large indigo-bellied cumulonimbus crowded in from the west through steamy skies: no more loitering - I fled!



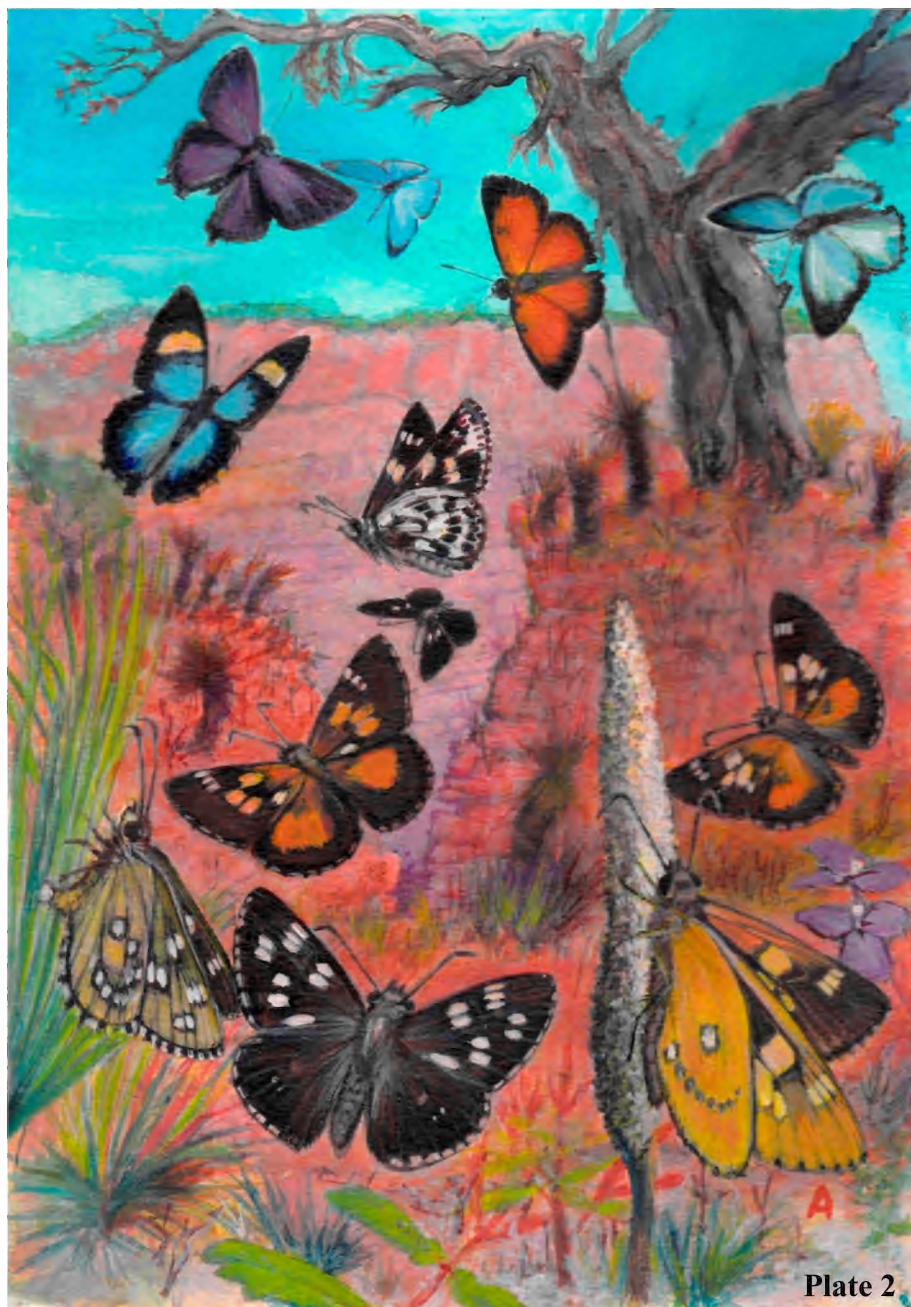


Plate 2



Back home in Rockhampton one of the ridge-topping skippers was found to be *Hesperilla furva* (Grey Sedge-skipper) a species that had only recently been discovered in the Eidsvold district by Don Sands, a second was *H. crypsigramma* (Wide-brand Sedge-skipper) (at that time placed, in the genus *Toxidia*). These skippers, including *H. sarnia*, sp.n (Swift Sedge-skipper) were later reviewed in a biological and taxonomic paper (my humble first) with the invaluable guidance of Ian Common (Atkins, 1978). A white-spotted skipper proved to be '*Pasma*' *polysema* (Spinifex Sand-skipper). This rare species was only known from a few specimens (a female at Petford, north Queensland and males near Darwin, NT) collected in 1911-12 by the celebrated Frederick Dodd.

A week later I was back, and further captures and observations revealed species of butterfly more common to the south, others clearly of a northern origin. Some even appeared to differ from their coastal neighbours. This was exciting stuff; the Blackdown Tableland seemed to hold isolated communities, but linking the butterfly fauna of the Great Dividing Range both to the south (including Carnarvon Gorge) and to the north. Perhaps the most note-worthy examples (collected nine months later) were the appearance of the Heath Ochre (*Trapezites phigalia*) and the Fringed Heath-blue (*Neolucia agricola*), both nearly 500 kilometres north of their recognized range (for further information on the distribution of *T. phigalia* see Atkins, 1999). In the gullies were sword-grasses, which produced juveniles of the Two-spotted Sedge-skipper (*Hesperilla malindeva*) and Spotted Sedge-skipper (*Hesperilla ornata*), the latter with a remarkable protruding pupal cap (in this species the caps vary from small 'beaks' and open prongs in Victoria and NSW to closed or variable down-turned 'trowels' in central and northern Queensland, or even small 'spatulas' in Cape York (fig.1); maybe a DNA study is needed here? There were other interesting butterflies; along sandy tracts of grass, sedges and iris flew dark-brown skippers painted with white spots. Unknown "Blues" (lycaenids) patrolled the higher shrubs and trees of the escarpment (these were later found to be species of *Ogyris*, *Hypochrysops* and *Acrodipsas*). Fast-flying migrants (pierids) surged over the ridge.

On the 28th of November 1971, John Landy and myself visited Blackdown; only to discover much of the plateau woodlands and heath had been incinerated to the ground (98%) by a wildfire that had escaped from a grazing property. Remarkably, the country recovered the following years, with most butterflies once again present in good numbers (Pl. 2). On the 4th March 1972, in a plateau gully of regrowth, I witnessed a remarkable sight, a speckled cloud of pale 'tinsel' floating over *Boronia* bushes - a colony of the rare lycaenid *Nesolycaena albosericea* (Satin Opal). This was the possible holotype (original) locality for the species, first collected by George Barnard and described by Miskin (1891).





Plate 3



Perhaps the most baffling observation was that of a larger, trapezitine skipper that appeared (occasionally), rapidly hill-topping on the escarpment, or visiting *Banksia*, *Xanthorrhoea* and *Leptospermum* flowers. With much sweat and effort, both males and females were eventually netted (the first on 16th of Sept., 1972). It took several more years of investigation and rearing (from eggs to final instar larvae) before I was confident enough to describe it as new to science (Atkins, 1997), and named it *Trapezites taori* (Sandstone Ochre), along with *T. genevieveae* (Ornate Ochre) (the latter from the rainforests of northern NSW and SE Qld.).

Subsequent trips to Blackdown were generally made (mostly alone) during weekends or during short camping holidays. These gradually revealed a prolific and diverse butterfly community especially along the sandstone ridges and at the escarpment near Horseshoe Lookout. Damper areas in the ravines and along the shallow streams or sedge and fern-clustered rock pools were also productive, especially near Mimosa Creek and at Rainbow Falls. Most of the species were found to be breeding in these areas, including *Heteronympha merope* (Common Brown) and *Geitoneura acantha* (Ringed Xenica).

One memorable (eerie) camping trip, when exploring the heathland before dawn, a whispered, fluttered zephyr of shadows moved above the heath: not bats but hundreds of Migratory Awls. Looking back, as I crawled between the boulders and tussocks, eight pale glowing (torch-lit) eyes moved slowly foreword - a pack of curious (and seemingly not hungry!) dingoes. They vanished when I shouted in delight, finding the first larva of *Proeidosia polysema* encased up side down, in a hard resinous, teepee-like shelter (fig 2.) within the tough spinifex (*Triodia mitchelli*) (what strong jaws the young larva must have!). This confirmed my suspicion that this hesperid taxonomically belonged with the southern Sand-skipper group.

More visits were to come (over fifty trips were made to Expedition Range between late November 1970 and 2000), these included field studies in the surrounding lowland dry forest areas, gorges (Pl.3), along the western escarpment, on the southern foothills and northeastern hill and brigalow woodlands. These areas produced the larvae of four species of *Jalmenus* (*eubulus*, *pseudictinus*, *daemeli* and *ictinus*) and the larvae of *Hypochrysops ignita* and *H. delicia duaringae*. The latter species feed on *Alphitonia excelsa* and the adults are small and very bright pale metallic blue and generally fly near dusk (see cover illustration). It is possible that this taxon may be a distinct species, with its southern limits the Sunshine Coast where its larvae commonly are found within the galls on *Acacia*.

Some of these Blackdown visits were aborted due to cyclones or monsoon storms, washaways, floods or new road works graded for large timber trucks. One late afternoon I was forced to return home via back roads due to a flash-flooding of the Dawson River. This added over 2 hours and 100 kilometres to the trip; and with a near empty fuel tank, I arrived back in Rockhampton covered in mud (beware of the local storms that appear from 'nowhere' in these extensive outback catchments which



feed the Fitzroy River system!). After the strong monsoons of the mid-70's, the wandering Small Green-banded Blue (*Psychonotis caelius*) expanded its range further west to Blackdown (see cover illustration).

In these early years much of the work continued at home, especially focusing on the biology of the butterflies of Blackdown and surrounding country, the most notable perhaps being that of *Nesolycaena albosericea*, Fiery Copper (*Paralucia pyrodiscus*), *Hypochrysops delicia* (see above), *Proeidosa polysema*, *Hesperilla sarnia*, *H. furva*, *H. crypsigramma* and *H. sexguttata*.

The species list was now approaching 100 (including some collected by colleagues) (see Atkins 1974, a & b). This included at least 31 new distribution (range) records. At this time several lepidopterists had visited Blackdown, including Zoo and Mary Souëf, Hiro Sibatani and Ray and Nola Manskie: Mary, in fact, was the first to collect a female Swift Sedge-skipper (feeding from Ti-tree flowers) on the Range. Other butterflies I observed there, but not collected, included the Azures *Ogyris* nr. *ianthis*, *O. zosine* and *O. oroetes* (the host ant of the first mentioned, *Frogatella kirbyi*, was found in the upper Lemon-scented gum woodlands). Larval eats were also observed of the Yellow Jewel (*Hypochrysops byzos*) on *Pomaderris* shrubs near the Rainbow Falls.

Over the years Expedition Range proved the most productive and interesting inland locality for Queensland butterflies, with several rare or local species reared from the near pristine scrub, heath and woodland. Diversity was most noticeable in the genera *Trapezites* (6 species); *Hesperilla* (6); *Acrodipsas* (5); *Ogyris* (5), *Jalmenus* (4), *Candalides* (5) and *Eurema* (5). It is likely that the Carnarvon Range (to the south-west and including the Salvatora-Rosa N.P.) will include a similar number and diversity of species.

Footnotes: Later, when living in Newcastle (NSW) and then in Eudlo (Qld.), I made a few more trips to the Blackdown Tableland (1984 – 2008). Many of the specimens collected during those years in central Queensland can be found in the ANIC, Canberra and others are housed in the Centre for Butterfly Research, University of Florida, USA.

Parts of the Blackdown Tableland were proclaimed a National Park in the mid-1980's, and hopefully the wider, general area is adequately protected as a reserve for its unique flora and fauna. However, further research is required in the forests, particularly in areas of wet sclerophyll, remnant rainforest and isolated swamplands along these southern upland butterfly habitats. Some genera of lycaenids, hesperiids and pierids in particular, are under-represented including *Candalides*, *Toxidia*, *Telicota*, *Ocybadistes* and *Taractrocera*.

During and after the 70's large areas of Brigalow and scrubland were 'ball-chained' to near-extinction. More recent government agricultural directives (2014-2015) have cleared 296,000 hectares of Queensland's natural woodlands and wetlands,



particularly in central Queensland. The Migratory Awl is now reduced to very small numbers and the Pale Imperial and Macqueen's Hairstreaks are all but gone. Those beautiful brigalow woodlands have barely survived mankind's greed - the 'salt table' still rises, and the mud-cracks grow to provide excellent habitats for the plague locust.

Acknowledgements

I warmly thank the many family, friends, rangers, botanists and lepidopterists in general for patience, help, company and advice during my 'Blackdown days' of exploration and research. The present and past indigenous people are acknowledged; their valued heritage, maintenance and custodianship of these rangelands and its wild life are symbolized by the stenciled handprints and symbolic art in the caves and rock overhangs at Expedition Range. I also thank Kelvyn Dunn for reading and correcting with comments on a draft of this manuscript.

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Illustrations (all created with water-colour and gouache media)

Front Cover

The plains of Expedition Range: near dusk

The 'Starlight Jewel' (*Hypochrysops delicia duaringae*) flying in twilight north of Dingo, central Queensland: foreground, male left, female (underside) right; background female centre; above left male Small Green-banded Blue (*Psychonotis caelius*), right female, settled on food plant (*Alphitonia excelsa*).



Plate 1

The foothills of Expedition Range: early morning

Migrants, the Migratory Awl (*Badamia exclamationis*), female foreground and males; Orange Migrant (*Catopsilia scylla*), female centre, males below and left background.

Plate 2

Blackdown Tableland: one year after the bushfire

Skippers; foreground right Sandstone Ochre (*Trapezites taori*) female feeding from Grass Tree, male just above; left foreground Spinifex Skipper (*Proeidosia polysema*) male front, female behind laying egg; centre female Heath Ochre (*Trapezites phigalia*); just above, male Iris Skipper (*Mesodina halyzia*); just above in background male Spotted Sedge-skipper (*Hesperilla ornata*): Blues: upper left female Southern Purple Azure (*Ogyris genoveva*); upper right female and male Sydney Azure (*Ogyris ianthis*); upper centre male Silky Azure (*Ogyris oroetes*); upper left male Northern Purple Azure (*Ogyris zosine*).

Plate 3

Blackdown Tableland: monsoon summer

Skippers: Foreground below, left male Broad-brand Sedge-skipper (*Hesperilla crysigramma*), centre male Swift Sedge-skipper (*Hesperilla sarnia*); right male Grey Sedge-skipper; centre female Double-spot Sedge-skipper (*Hesperilla malindeva*); above right female *Hesperilla sarnia*. Blues: Middle left a male and two females (with broader black wing-tips) Bright Opal (*Nesolycaena albosericea*); top left Fiery Copper (*Paralucia pyrodiscus*).

Note: The butterflies depicted are in habitat perspective and not necessarily in relative size.

Figures (graphite)



1. Pupal caps (dorsal view) of *Hesperilla ornata* (Spotted Sedge-skipper): left, *H. o. monotherma*, Iron Range, NQ; middle, *H. ornata*, Blackdown Tableland, CQ; right, *H. ornata* Mt Archer (Rockhampton) CQ.





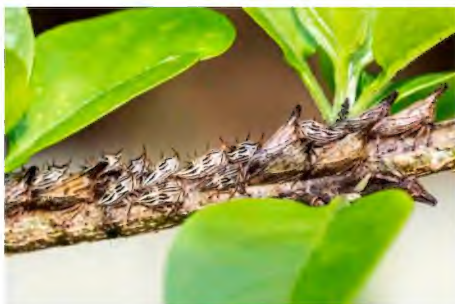
2. Larval shelter of *Proeidosia polysema* (Spinifex Sand-skipper) on *Triodia mitchelli* (Spinifex).

All artwork by Andrew Atkins

ITEMS OF INTEREST

A Thorny Issue – Lois Hughes

I have always been a “sucker” for cute. Some time ago I had been admiring a row of cute insects that had congregated on some of the stems of one of our favourite butterfly nectar plants, the vanilla scented, White Duranta, until I realised, with some dismay, what they were!



Adults of *Aconophora compressa* with nymphs during September 2015

Resembling thorns, these were the “dreaded” lantana sap-sucking bug, *Aconophora compressa*! This incident occurred in 2003.

Newspaper and magazine articles at the time variously described them as “an invader as bad as the cane toad”, “backyard monster” and “bug bear” so I was none too pleased to find them here! Much of the furore was, of course, directed at the Government of the day, for these insects had been released as a biocontrol agent for that

other thorny pest, *Lantana camara*. Lantana is listed both as a “Weed of National Significance” and one of Australia’s “Most Wanted Weeds”. Perhaps that should be “Most Unwanted Weeds” of our bush and farmland!



So after many years since the release of this bug, just what is the consensus of opinion regarding its usefulness as a control agent of lantana and the actual, rather than the perceived, threat to a range of both ornamental garden shrubs and trees plus some of our native species?



Adult on my finger

Firstly some background to the life history of *Aconophora compressor* and its lantana host. *Lantana camara* is a shrub of the Verbenaceae family originating from tropical America and introduced into Australia as a garden ornamental. It is well known that lantanas escape from garden confines into the wider environment causing massive degradation of our bush and farmland and has cost farmers and government agencies many billions of dollars in eradication programmes.



White adult, possibly just after its final instar moult, with nymphs



Adults with striped nymphs at various stages

On the other hand, bio-control reduces herbicide use and is often much more cost effective as it releases a natural enemy to combat a pest. So from 1990 to 1994, sixty-two plant species were tested

using the lantana sap-sucking bug from Mexico. It was finally approved for release on the basis that the insect would not complete its life-cycle on any plants tested other than lantana and to a lesser extent, duranta. I obtained this information from NRM facts, 2003, The State of Queensland (Department of Natural Resources and Mines).

The following lifecycle information was obtained from F. Heystek and J.R. Baars in a research article, 2005, Biology and host range of *Aconophora compressor*, a candidate considered as a biocontrol agent of *Lantana camara* in Africa.



“The female partially inserts the eggs into the woody portion of actively growing stems and guards them against potential predators. Nymphs develop through five instars to the adult stage in about 45 days. The adults and nymphs feed on the sap of stems causing leaves to wilt, the flowers to abort and the gradual dieback of stems.”

From my experience the bug returns each year and always appears on the duranta as well as on the lantana. It exudes copious amounts of very sticky honeydew, a sugary solution in which sooty mould grows, usually in bands encircling the stems. Adults and nymphs feed together, in groups, on the chosen stems, causing the leaves to wilt and yellow. The whole plant usually isn't affected, maybe only 4 or 5 branches per bush.

However, during 2015, on our property at Mt. Cotton, SE Queensland, the lantana, already stressed because of dry conditions, was seriously attacked by the bug, leaving large areas of the shrubs leafless and seemingly dead, a condition I closely observed, hoping they really were dead.

After the extremely hot days during late December and early January, the bugs departed, a normal occurrence according to research and my experience. The lantana has now regrown so the setback is only temporary and is flowering profusely after welcome rain. The usefulness of the bug here would be the exposing of the base of the plant, making it easier to dig or pull it out by the roots, without first hacking through lots of thorny branches tearing at our skin.

The exotic ornamental Fiddlewood trees were severely defoliated during initial releases of the bug which prompted many of the angry responses. According to the Government bulletin *Eremophila* species, Jacaranda, *Clerodendrum ugandense*, *Myoporum* species, *Pandorea* species, some mangrove species as well as the exotic, weedy groundsel bush, may also be impacted.

However the bug only lives for 6 months and from all reports, it would appear that none of the affected plants actually died, but recovered after the bug's departure.

Some garden sprays are recommended and can be used against the bugs, but I prefer to cut off the “bugged” branches and place them amongst lantana bushes where they are really needed.

So it could be concluded that my initial fears for our favourite shrub's demise were unfounded and that lantana bushes are still having “the last laugh” and flourishing regardless. I still think the “thorny” bugs are cute, though!

Photos Erica Siegel



An Aphid Story – Bernie Franzmann

I knew aphids were members of the true bugs (Hemiptera) but I didn't know much more about them. I had the idea that they were sort of mysterious creatures that were quite a bit different, in many ways, to most other insects.

Way back in 1971, I was working at a research Station at South Johnstone in North Queensland. All the other scientists at the station were researching pastures and beef cattle. I was the only Entomologist and was researching pests of bananas. The pasture people found an insect devastating one of their prized pasture grasses, pangola grass, *Digitaria decumbens*. I told them it was an aphid (I found later that it was *Schizaphis hypersiphonata* which had only been named the year before) and they asked me to enlighten them about aphids. Now this was a long time before Google and Wikipedia.

So I looked in the only book I had (Imms, A. D. (1964) - A General Textbook of Entomology).

The book explained that the life cycle for a 'typical' aphid, *Aphis fabae* is as follows.

The ova which are laid on *Euonymus* hatch into fundatrices (apterous, viviparous, pathogenetic females) which emerge in spring. These females produce fundatrigeniae which are also apterous, viviparous, pathogenic females which stay on *Euonymus* or, usually after two or three generations, migrantes (alate, viviparous, pathogenic females) are produced. They fly to a secondary host and develop into alienoicolae, which become sexuparae, which become sexuales ...!! – WHAT??. Talk about mysterious creatures.

As my knowledge of aphids increased I found out that this aphid's life cycle is relatively simple and typical of aphids in warm climates. The winged adults fly to their host plants, settle down, feed and rapidly produce large numbers of wingless female nymphs. After developing for about five days these nymphs mature and start producing their own daughters. Nymphs are produced at the rate of one every four hours. So one female becomes about 4000 in three weeks. Rapid reproduction is also achieved by the amazing biology where the nymphs, being produced inside the adults, are already producing their own daughters *i.e.* mothers are already carrying their own granddaughters. Also, they don't have to stop and mate, as males are never produced. Are you still with me?

This rapid production goes on until things get too crowded, or the host plant begins to die or the weather dictates and so instead of producing wingless nymphs, winged ones develop and fly away to find fresh host plants.

Although aphid populations can develop very rapidly they are subject to some very effective natural enemies including ladybirds, hoverflies, lacewings, parasitic wasps and fungal infections.

There are about 180 aphid species in Australia but only about 20 are native.



Some of the common aphids you might see in South East Queensland are:



Sowthistle aphid, *Hyperomyzus lactucae* – on thistles. *Image* – The two black ones are winged (alate) adults. Winged aphids are commonly a different colour to their wingless sisters. Another aphid commonly found on thistles is the brown thistle aphid, *Uroleucon sonchi*, which is brown and larger than *H. lactucae*.

Photo Magnus Gammelgaard
<http://www.plant-diseases.com>



Cabbage aphid, *Brevicoryne brassicae* – on cabbage and its relatives. *Image* – These aphids are covered in wax. The brown aphid in the middle is a mummy. Aphids are commonly attacked by parasitic wasps. When the wasp larva has consumed the internal contents it pupates and the aphid turns hard and brown (mummifies). The adult wasp emerges by cutting a neat round hole in the mummy.

Photo Magnus Gammelgaard



Rose aphid, *Macrosiphum rosae* – on roses. *Image* – The white flecks in this image are the cast “skins” of the nymphs. Aphids moult four times.

Photo Magnus Gammelgaard



Milkweed aphid, *Aphis nerii* – on milkweed and oleander. *Image* – There’s no mistaking these bright yellow aphids. It’s not surprising that they are toxic to some of their potential predators.

Photo Jenny Thynne
<https://flic.kr/p/KchUaz>





Citrus aphids – Brown citrus aphid *Toxoptera citricida*, Black citrus aphid *T. aurantii* – on citrus. The image is of *T. aurantii*, but nobody would know, as the only easy way to tell them apart is by counting the number of hairs on the little knob that sticks out from the middle of the back end (cauda). One species has less than 20 and the other about 30 hairs. Did I just say “easy way”?

Photo Lyle Buss, University of Florida

Our thanks go to the various photographers who allowed us to use their images.



Cotton aphid, *Aphis gossypii* – on melons and many weeds. *Image* – The image shows the colour variation seen in this species.

Photo Magnus Gammelgaard

Some aphids are very serious pests of Australian agriculture. A new one (the Russian wheat aphid) was found for the first time only in May, this year. At present it is only in South Australia, Victoria and New South Wales but will eventually invade all states and pose a significant problem for wheat and barley production.

Life history notes on the Large Purple Line-blue, *Nacaduba berenice berenice* (Herrich-Schaffer, 1869) Lepidoptera:

Lycaenidae – Wesley Jenkinson



The Large Purple Line-blue is encountered sporadically, southwards from north-eastern Queensland, both coastally and west of the Great Dividing Range. It continues through central and south-eastern Queensland into central and southern coastal New South Wales.

This species preferred habitats are tropical, subtropical, littoral rainforests and dry vine scrub. It is also commonly found in urban gardens in south-eastern Queensland where host trees have been planted. This species can be very common seasonally, particularly in littoral rainforest.



Males fly around the canopy where they typically settle on outer foliage of trees with heads angled slightly downwards and wings closed, deflecting the sunlight. They are territorial and chase off rival males and other small lycaenids. Females are often observed flying in dappled sunlight within forested areas looking for sheltered host trees. During extremely hot weather the adults frequently settle within a couple of metres of the ground on trees and shrubs in forest understorey. They feed from a wide variety of small exotic and native flowers. While feeding, the wings remain closed and occasionally the hind wings are slightly alternated up and down.

There are a few line-blues and other small lycaenids that are rather similar in appearance. In comparison with similar species, the adults of this species should be able to be separated by the slightly larger size, the rather uniform underside pattern and the presence of the hindwing tails. Voucher specimens may be required to identify runt sized specimens or worn specimens with the hindwing tails missing.

The sexes can be identified by the upperside wing colouration, males being lilac and females having bright blue metallic scales with varying extent on the forewing.

The adults show variations between summer and winter forms. Both sexes vary between the seasons with the underside black tornal spot larger in the summer form and reduced or absent in the winter form. In addition the females' bright blue coloration on the upperside is reduced and can be slightly darker in the summer form. Intermediate forms occur in spring and particularly autumn.

Wingspans for the pictured males are 24mm and 25mm for the females.



***Nacaduba berenice berenice* (Large Purple Line-blue)**

Images left to right: male, female, male underside, female underside (summer specimens)



***Nacaduba berenice berenice* (Large Purple Line-blue)**

Images left to right: male, female, male underside, female underside (winter specimens)



The larvae of this species have been recorded by various authors feeding on the flower buds and young shoots of various trees in the families, Proteaceae, Sapindaceae, and Ulmaceae (Braby, 2000; Moss, 2010).

During October in 2005 a female was observed ovipositing on a young flower bud of a Tuckeroo Tree (*Cupaniopsis anacardioides*) a known host. She typically flew slowly throughout the host tree branches and settled in a sheltered position. She then walked around for a short period and curled her abdomen onto the bud, then laid a single egg. This egg was kept for life history studies. Females oviposit from mid-morning to mid-afternoon in sunny conditions.

The larva raised in captivity did not consume the eggshell after emergence. The highly camouflaged larva rested and fed openly during daylight hours on fresh leaf buds and flower buds of the host plant. Under natural conditions the larvae are occasionally attended by small ants from various families. The larva attained a length of 11mm and completed five instars.



The egg was white, mandarin shaped with small rounded raised projections, approximately 0.3mm high x 0.5mm wide.

Freshly laid egg



1st instar larva



2nd instar larva



3rd instar larva above

4th instar larva left



5th instar larva lateral view



Pupa



The pupa, measuring 8mm in length, was located below a leaf of the host plant. It was attached with silk by the cremaster and a central girdle.

The total time from egg to adult was 25 days, with egg duration of 6 days, larval duration of 12 days and pupal duration of 7 days.



Images from left to right show two larvae attended by small black ants, a single larva attended by two green-head ants (*Rhytidoponera* sp.) and a pre pupa.

Within the boundary of the Scenic Rim Regional Shire south of Brisbane I have adult records for all months of the year. In this region records indicate there are several generations annually. Most likely dependant on rainfall, the adults are common in summer and autumn and less numerous in late winter and spring.

I would like to thank John Moss for commenting on the manuscript.

Photos Wesley Jenkinson

References:

- Braby, M.F., 2000. Butterflies of Australia – Their Identification, Biology and Distribution. vol 2. CSIRO Publishing.
- Moss, J.T. 2010. Butterfly Host Plants of south-east Queensland and northern New South Wales. 3rd edition, BOIC.

An update on the Club Website – www.boic.org.au – *Ross Kendall*

Since the release of the club’s mistletoe book in April, I have been able to devote more time to our website and I invite members to have a browse.

One new feature is a “Moth Photo Gallery” page, which currently has information and images of over 100 species of Crambid moths. This information and the images come from extensive work by Peter Hendry and Graham McDonald over several years. I have to admit that I have paid little attention to these rather small moths in the past but, having now seen them “close up”, I realise that many of them are quite beautiful. Peter and Graham have done a great job with “light trapping”, photography and painstaking identification – more to come!

There is much more that can be added to the moth page as the Crambid family is just one of many families of moths.



You may not have seen our “Butterfly Photo Gallery” page recently. Like the other pages, this is a work in progress. I have many spectacular images yet to be added.

There are now quite a few reproductions of past articles first published in “Metamorphosis Australia” which can be found on the “Creature Feature” and “Plant Profile” pages.

I invite you to share images you may have by emailing them to me for addition to our pages. These will be acknowledged. Suggestions to improve the website are always welcome.

Enjoy.



1. *Agrotera pictalis*
Photo Peter Hendry
2. *Conogethes haemactalis*
Photo Graham McDonald
3. *Strepsinoma croesusalis*
Photo Graham McDonald
4. *Talanga sabacusalis*
Photo Peter Hendry



Concluding Graham McDonald's 5 part series of "Gardening for Butterflies" which was originally published beginning with issue #17 June 2000.

PART 5 - HEATHLAND AND WETLAND GARDENS

A heathland garden requires full sun and very well-drained soils and is really like a dry sclerophyll garden but lacking the tree canopy. The same gardening principles apply as to dry sclerophyll gardens with emphasis on raised beds, but with access to moisture at depth. This can be achieved by channel and mound design or with a dripper system of irrigation.

Many colourful shrubs can be grown in this garden together with matrushes, groundcovers, annuals and hardy clumping grasses. This type of garden also lends itself to the planting of nectar species such as *Pimelea* sp., *Xerochrysum*, *Leucopogon*?, *Bursaria spinosa*, *Micromelum minutum*, *Pavetta australiensis* and *Westringea eremicola*.

A successful wetland area can be achieved by anyone with a low section on their property or even if the land is sloping, a small boggy area can be created by digging a depression to catch the run-off. Lining with plastic or a pond liner, if requiring a pond, may be necessary to prevent the moisture from draining away. Quite a few butterflies utilise sedges and rushes which are the typical plants of such areas.

Larger areas can be planted with a few moisture-loving trees, such as *Melaleuca quinquenervia*, *Melaleuca sieberi*, *Melaleuca linariifolia* and *Melaleuca salicina*, which have good nectar at certain times of the year.

An understorey of large and small sedges fill in the ground layer. These plants are fast-growing, spread easily and are rewarding to grow, but will require extra water in dry periods.

Larger Sedges and Wetland Plants

Carex appressa (Tall Sedge) - Spotted Sedge Skipper

Cladium procerum (Leafy Twigrush) - Southern Sedge-darter

Gahnia clarkei (Tall Sedge) - Swordgrass Brown, Spotted Sedge Skipper,
Painted Sedge Skipper

Gahnia sieberiana (Redfruited Sawsedge) - Flame Sedge Skipper, Varied
Sedge Skipper, Spotted Sedge Skipper, Swordgrass Brown

Lomandra hystrix (Riverine Matrush) - Northern Silver Ochre, Brown Ochre
and Splendid Ochre

Smaller Sedges and Wetland Plants

Alternanthera denticulata (Lesser Joyweed) - Varied Eggfly

Carex brunnea (Rainforest Sedge) - Spotted Sedge Skipper

Carex polyantha - Skippers/Browns

Cyperus spp. (Sedges) - Six-spot Skipper (now "Riverine Sedge-Skipper")

Fimbristylis spp. (Fringerushes)



Hygrophila angustifolia - Chocolate Argus, Tiny Grass Blue, Blue Argus
Lythrum salicaria (an ornamental)
Ludwigia peploides (an ornamental)

Vines

Cynanchum carnosum (Mangrove Milk Vine) - Swamp Tiger,
 Lesser Wanderer
Parsonsia straminea (Common Silkpod) - Common Crow,
 also excellent nectar plant

Herbs

A small corner of the garden could be thrown open to the creation of a rather untidy and weedy type of garden which could become a haven for butterflies. The criteria which would have to be met for such a style of garden would be:

1. Sun for most of the day
2. Not in view from most parts of the house
3. The owner would have to be one of those very rare people who put nature ahead of their own primitive European view of a world of pruned trees set in perfect lawns.

This 'style' of garden is very low maintenance provided that the plants are able to "do their own thing". Undesirable weeds such as Asparagus, Scotch Thistles and other non-butterfly friendly species can be hand pulled from time to time. The addition of blood and bone will benefit the rapid growth of the weedy plants and help to keep fresh soft leaves coming on.

Some examples of these plants and the butterflies that they attract are listed below:

Alternanthera denticulata (Lesser Joyweed) - Varied Eggfly

Ammobium alatum - Australian Painted Lady

Xerochrysum bracteatum (Paper Daisy) - Australian Painted Lady

Canavalia rosea - Purple Cerulean

Chamaecrista nomame (*Cassia mimosoides*) - No-brand Grass Yellow

Cassytha spp. (Dodder) - Blotched Dusky-blue, Small and Twin-dusky Blues

Centaureum spicatum - Meadow Argus

Cullen tenax - Chequered Swallowtail

Desmodium heterocarpon - Common Grass Blue, Orange-tipped Pea-blue

Gnaphalium spp. & *Pseudognaphalium* spp.- Australian Painted Lady

Hybanthus stellarioides - Small Greasy (Glasswing)

Hygrophila angustifolia (plant in wet spots) - Tiny Grass Blue, Chocolate Argus,
 Blue Argus

Hypoestes floribunda - Blue Argus

Indigofera hirsuta - Jewelled Grass-blue, Long-tailed Pea-blue, Large Grass-yellow,
 Common Grass Blue

Oplismenis aemulus (Creeping Beard Grass) - Lilac Grass-skipper

Oxalis corniculata (Yellow Wood Sorrell) - Chequered Copper

Plantago spp. - Meadow Argus, Rayed Blue



Varied Eggfly



Plumbago zeylanica (Native Plumbago) - Zebra Blue
Portulaca oleracea -Danaid Eggfly, Meadow Argus
Rostellularia adscendens (Justicia species) - Blue Argus
Scaevola aemula, *S. ramosissima* (Fan Flowers) - Meadow Argus
Senna spp. (Cassias) - Grass Yellow
Sesbania cannabina Long-tailed Pea-blue, Large [=Common] Grass Yellow,
 Spotted Pea-blue

Sida rhombifolia - Varied Eggfly
Tribulus terrestris - Spotted Grass-blue
Urtica spp. - Yellow Admiral
Verbena spp. - Meadow Argus
Veronica plebeian - Meadow Argus



Meadow Argus

Summary

All good things come to those who wait. Your butterfly garden has now been created, but where are the jewels of the insect world? If you live near healthy and diverse bushland, your wait will be short. Inner city or suburban yards may take longer to attract butterflies which must find your little piece of heaven, but if your plants are healthy and abundant and the correct species, the butterflies may settle down to breed there.

Line drawings by Lois Hughes

Recent Butterfly Observations in Bundanoon, Southern Highlands NSW – Alan Hyman

From mid-April to mid-September there were very few butterflies apparent in our area – not surprising during a cold winter at an altitude of about 670 metres.

Then the Australian Painted Lady (*Vanessa kershawi*) started to appear, first in small numbers during October until we experienced a migration of almost ‘tropical’ proportions, moving, it seemed, in a north-south direction. In the nearby Morton National Park they are extremely common along the roadways and roadsides basking in the sunlight or manoeuvring in multiples, often following the walker along. A lesser but parallel migration of Caper Whites (*Belenois java*) is also taking place, but apparently moving in the opposite direction. Ensnared in this flight are one or two White Migrants (*Catopsilia pyranthe*) and this has been a new species sighting for me (No. 58) in our district.

Other species appearing in small numbers recently have been Macleay’s Swallowtail (*Graphium macleayanus*); Imperial White (*Delias harpalyce*); Black Jezebel (*Delias nigrina*); Cabbage White (*Pieris rapae*); Small Grass Yellow (*Eurema smilax*); Forest



Brown (*Argynnis cyrila*); Brown Ringlet (*Hypocysta metirius*); Meadow Argus (*Junonia villida*); Yellow Admiral (*Vanessa itea*); Common Grass Blue (*Zizina labradus*); Yellow-spotted Blue (*Candalides xanthospilos*) and Long-tailed Pea-blue (*Lampides boeticus*).

It is gratifying also to see fresh specimens of a favourite species, the local race of the Sword Grass Brown (*Tisiphone abeona abeona*). Also sighted for 5-6 seconds was a smallish butterfly, very dark colouration, fluttering down a park road before heading into the bush at a height of 2-3 metres (*Ogyris* species?).

I'm hoping for a more prolific season than the previous few years, with perhaps a few surprises in store.

BOOK REVIEWS

Insects of South-Eastern Australia – An Ecological and

Behavioural Guide by Roger Farrow. Paperback, 288pp. 148x215x18mm
CSIRO Publishing May 2016 RRP \$45 ISBN 978 14863 04769 Reviewed by Alan Hyman



To cover a multiplicity of insect orders and compress the information into a usable field guide (even within a restricted geographical area) has obviously been a labour of dedication by its author, Dr Roger Farrow. Educated in England, his depth of experience is vast, including 6 years of research on locusts in Mali and subsequent work for 25 years with the CSIRO studying locusts and other insects, producing more than 80 scientific papers. Now in retirement, he has drawn on his extensive knowledge and photographic skills to produce this valuable aid to insect identification. As the preface notes: 'The Guide is directed towards anyone with an interest in the rich natural history

of insects in South-Eastern Australia' (with) 'the fieldwork ... mainly conducted in the Southern Tablelands of NSW and adjacent ranges...'. The author adds however, that 'most of the insects covered have a much wider range in south-eastern Australia and beyond'. Unfortunately there is no inclusion of a regional map, which while not absolutely essential, would have been beneficial here.

Although the guide commences traditionally enough with a preface, acknowledgements and introduction – and concludes with appendices, a glossary, references and indexes, it does not, as one might expect, consist of a series of chapters each devoted to a specific insect order. Instead, the subtitle 'An Ecological and Behavioural Guide' provides the clue to the book's layout and structure. Individual species or families of a specific order are variously placed in different sections throughout the book according to their environments and habits rather than being



strictly confined to their groups. It is useful here to list some of the major contents as this gives a good indication as to the breadth and scope of the book. The work is divided into two parts.

Part 1, 'An ecological and behavioural approach to insect identification' comprises ten chapters including such topics as: Regional environments and where to find insects; Defining an insect; Insect classification: from species to order; Insect and annual life cycles; Feeding strategies, behaviour, habitats, constructions and domiciles. In turn, some chapters are further divided into sections. For example, the 'Behaviour and Habitats' chapter includes: Social insects, sub-social attributes and communal behaviour; Mimicry; Aquatic and riparian insects; Cave insects and Domestic insects. Additionally, certain attributes of characteristics are highlighted in 'boxes'. For example, in the Annual life cycle chapter, (box 4) features 'Camouflage'. Also included here are two useful diagrams which simply and clearly illustrate typical examples of one and two generation annual life cycles.

PART 2, 'Insects in their environment' is even more extensive. Chapters include: The plant feeders; The predators; The blood feeders; Parasitoids; The decomposers and Non-feeding and perching insects. Once again, these chapters are divided into sections. For example, 'The Decomposers' deals with insects' presence in litter, decaying wood, compost and soil, carrion and dung. The section concludes with a 'box' which focuses on attracting native insects to your garden.

As previously indicated, the result of placing insects in the guide according to the above criteria means that examples of each insect order are not confined to one specific area of the book. This is especially true of the beetles (Coleoptera). While many can be found grouped together by family within say, the Plant Feeders section, e.g. leaf beetles (Chrysomelidae), other species or genera are distributed throughout different parts of the guide, depending on environment or behaviour.

Many small mysteries are solved or clarified in the book. For example, most of us would be familiar with sawfly larvae (Hymenoptera – *Pergidae*) which 'rear up' from a leaf when disturbed – but who is familiar with the adult insect? The Guide's close-up photographs include several species either guarding their larvae from attack or feeding at flowers. The text explains that they differ from 'wasps and bees by lack of a 'waist' between thorax and abdomen'.

Most of the 19 butterflies (Lepidoptera) featured occur in the lengthy 'Plant Feeders' section in Part 2. While this is only a relatively small cross section of the region's overall butterfly fauna, the species depicted are typical enough to at least assign the family or even the genus to a specimen sighting. For more precise identification and study, the reader is directed to the References and further Reading section for the appropriate order-specific guidebook.

While I am reasonably comfortable naming a butterfly in the field, my knowledge of the other insect orders is fairly basic. Therefore any book which assists the interested



lay person in identifying, say a larva burrowing in the backyard soil or an unknown 'bug' munching on the leaf of a prized plant, is of great value. On a personal note, I must admit taking a 'short-cut' with my first practical consultation of the book. Recently, while digging a couple of holes for planting under a conifer on a midwinter's day, I encountered at a depth of maybe 200-250mm, two large apple-green beetles. While initially 'inert', they soon proved to be very much alive, having obviously been disturbed prematurely. A quick 'flick through' of the guide revealed a photograph of the very species, the Green Christmas Beetle, *Xylonychus eucalypti*. According to the text, these 'adult beetles emerge from the ground in mid-summer and fly to the nearest eucalypt tree to feed and mate but they occasionally aggregate on other trees and shrubs'. If a more systematic approach is used, as the preface states, 'this guide should enable the user to place most insects encountered in our area in a particular feeding group and family, and will usually provide a genus and common name, and possibly a species name'.

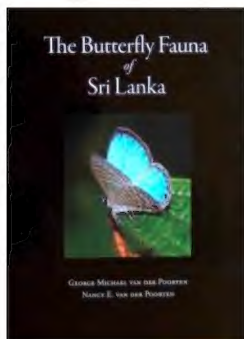
The Guide's layout is uncomplicated to follow and read, the main text utilising a simple two column format for the most part, with a small (9 point) but clear serified typeface, with a 12 point line spacing making for enhanced readability. The 'boxed' areas, by contrast, are differentiated with a full page width (single column) format, background tinted, with a crisp sans serif text, again in readable 9/12 point typesetting. Each picture caption is a mine of information in its own right. It includes the insect's common name (where assigned), scientific name, size in millimetres, location of photograph and other pertinent details. Although the captions are set in 7 point type, they are still quite legible. The author quotes the old saying 'a picture is worth a thousand words' and 'so emphasis is placed on the photographs of insects behaving in their natural environment...'. The quality of the photographs is generally very good (and there are many hundreds) although occasionally, as the author states: 'In some images the 'clutter' in the background reduces the visual impact of the target species, but this is how insects are seen in the wild'. At the commencement of the book there is also a series of landscapes depicting the various vegetated insect habitat types.

The guide is unique in that it can be used to readily identify an unknown adult insect or its immature stages encountered in the wild, or equally, an environment or habitat may be searched, e.g. under bark, in streams, on flowers etc. with an appreciation or expectation of the kind of species that might be found there. In summary, Roger Farrow takes a refreshing approach to his subject. Because of the sheer numbers, it would be impossible to identify all insects observed down to species level, but the bibliography directs the reader to more detailed information on specific insect orders. The guide will have appeal across a full spectrum of readers, non-specialists and specialists alike – from gardeners, nurserymen and bushwalkers to land care persons and professional entomologists. This book will become an indispensable item in your field kit bag but the addition of a weatherproof protective cover is strongly recommended!



***The Butterfly Fauna of Sri Lanka.* George Michael van der Poorten and Nancy E. van der Poorten.** Lepodon Books. 2016. vi+418 pp; hardback; approx. ~A4 sized. ISBN 978-1-77136-189-7. a. ~AUS \$97 incl. postage

Reviewed by Kelyvn L. Dunn



The Indian subcontinent is a biogeographic region I have not explored and because of that, Sri Lanka, an intriguing island only 30 km off shore, has escaped my field attention – at least beyond those ‘armchair encounters’ romanced of during perusals of older works when the island was known as Ceylon. On skimming the detailed species accounts in this new butterfly book, I recognised one small lycaenid I had seen once, somewhere! It was not a splendid insect that I should remember her well, and I paused to think as to where and when. My digitised field diaries quickly revealed that archived account. It was during a mid-afternoon stroll at

Kandawgyi Lake, Mingala Taung Nyuat, a parkland area in Yangon, that I chanced upon this curious miletine with its remarkable flight, quite unlike any species I had seen previously in Myanmar (formerly Burma) or elsewhere in southeast Asia. Video-cam in hand, I recorded a short sequence of her activity, mystified at the time as to the butterfly species involved. She fluttered about a chenopod, marked by a botanical plaque identifying it as *Bassella rubra* Linn, whereupon she would almost jump at the stems with her wings closed and long abdomen extended. It was nearly 1600 h and shortly after first sighting her active in sunshine, this sombre adult then oviposited under a leaf before departing to rest close by on a piece of wood. At the time, in January 2005, I had supposed that the chenopod would be the larval food plant, but later discovered that the caterpillars of this particular species, *Spalgis epius*, are carnivorous! They eat mealy bugs – a very different life history to any butterfly in Australia; and I learnt too, that this species is known as the Apefly because the pupa looks like a monkey’s head! The van der Poorten’s tome on the butterflies of Sri Lanka discusses the Apefly as well as other species one might encounter more broadly in Asia. This excellent work has drawn this tiny island – once fancifully described as ‘The Pearl of the Indian Ocean’ – into focus again after an entomological quiescence since 1950 (when the last academic treatise on its butterflies appeared).

Aesthetically adorned with a basking sky-blue Cerulean on the cover, the work immediately impresses with the grandeur it deserves. The van der Poorten’s achievement has evidently been a labour of love and one that will certainly provide that needed stimulus for a visit someday by naturalists who share their passion for these delightful creatures. Even if that opportunity should pass me by (and I hope that it would not), the hours I have spent reading the accounts of the 247 species, carefully studying the illustrations of each, and contemplating their varied behaviours, their life



histories and their larval hosts (listed for 89% of these species) has enlightened me. Some may wonder what the Australian enthusiast or expert might glean from this work on a remote island, far afield, off the southern tip of India! Essentially, much – if only because some larval hosts newly reported from Sri Lanka occur more widely in the Asia-Pacific region. Indeed, that knowledge of usage elsewhere now offers wisdom to the field worker who may seek similar potential among allied species and genera in northern Australia.

The first chapter informs generally about Sri Lanka, highlighting its topography and dual-monsoonal climate, and examines the origin of its fauna and overviews the history of the study of its species. Although endemism is low overall, an area in the southwest of the island that has no pronounced drought (unlike the rest of the island) shows a remarkable concentration of endemic species (21 of the 31 endemic species occur there). In addition, isolation from the mainland since the Pleistocene has differentiated the local species into some 84 subspecies (as recognised in the work) and still others show fine ecological specialisation in terms of host plant preferences. The life cycle of the butterfly, described in the next chapter, covers many aspects of butterfly anatomy and structure, their habits and behaviours (including migration, courtship and oviposition), as well as factors influencing their survival (with focus on predatory avoidance and the various escape-mechanisms employed to enhance their longevity). Readers will be astonished at how a caterpillar of one swallowtail, whose two large eyespots, together with its everted osmeteria (which resembles a forked tongue), mimics the head of a hemotoxic green tree viper, a group of snakes that are widespread in Asia. The caterpillar even has a white rim just like the White-lipped Pit Viper, a serpent that inflicts a wound that creates extreme pain and necrotises within minutes.

The third chapter outlines seven impediments to the conservation of invertebrates and raises the need to conserve butterflies on the island outside of reserves. Human settlement, as the main threat to butterflies, has necessitated extensive clearing of native vegetation over the past 175 years. Today only 22% of the island remains vegetatively intact, and in one of the four climatic zones 90% of the original habitat is now gone. Decried by concerned naturalists as far back as the early 1920s, that long-term plundering of its forest resources is more than obviously at the species level – almost half the butterfly fauna is facing extinction to varying extents, with 59 species now listed as endangered (some critically so). As a small offset against this irreplaceable loss, the authors promote the value of butterfly gardening in urban areas; they point out how a bare plot of ground in a city hospital complex (where no butterflies resided) soon supported 40 resident species within two years of planting a garden of appropriate larval hosts and adult nectar sources!

The species accounts (Chapters 5-10 – with the layout expanded upon in Chapter 4) overview the fauna sequentially on a family basis, starting with the skippers and ending with the metalmarks. Each species occupies a page or two, and each contains a



number of images of live adults (with few exceptions), often enhanced by a selection of images of the early stages, the habitats occupied, and occasionally larval host plants (where known), including foliage with flowers to ease their recognition. Some accounts include other aspects of their biology: a sequence of 12 photos for one skipper (the Black Flat), as one example, shows the construction of a larval shelter cut from and then sewn onto the leaf. Most if not all the images are superb, none looks seriously manipulated. Adding a sense of realism, images of road kill display a few species that rarely open their wings; apart from revealing these adults worse for their experience, they serve to highlight the plight of many butterflies nowadays, even in those high-level reserves aimed to protect them. Captions of others sometimes explain unusual circumstances thereby improving the visual story of their photography, something charming in itself (p. 33 includes a poignant example of finality).

Many faunal works focus on the adult stage and this book certainly equals those in that aspect. It expands on this, too, with an impressive and invaluable array of life history photographs (Appendix F), presented stage by stage, and sequentially by common name (followed by the species name for larvae but not the eggs or pupae). It also includes a series of larval heads for selected skippers. An excellent memory for local butterfly names will assist the user to compare the juvenile stages of similar species more speedily and so appreciate features in common between more closely or even distantly related groups (even where not on the same page as the case is more likely to be). The list of larval host plants (Appendix C), another comprehensive resource, adopts a similar arrangement, with hosts listed alphabetically by botanical name (albeit unordered by family), and includes the dependent butterflies listed by common names. An international audience which may wish to hone in generically to sense that knowledge and utilise it where required will need to consult the index more often than not.

The annotated species list (Appendix A) provides the nomenclatural authorities for technical names and the years of description. It also inventories the conservation status of each species and their adult abundances in each of the four zones (where applicable) using a tripartite categorisation of probability defined by ‘very likely’, ‘likely’ or ‘unlikely’ to be seen during a four to five hour visit in each zone. Another Appendix (B) provides an annotated list of cornerstone scientific volumes and important historic papers dealing with the island’s fauna across its entomological history for further reading. Still another (D) lists known nectar sources but these are unlinked to butterfly species, except for a few cases where mentioned in the individual species accounts. Linking these to the list of species in Appendix A (if coded by number) would have enhanced this inventory given that few lists for flowers and the butterfly species that utilise them are available. Indeed, the authors explain that the length of the proboscis of various species may mechanically restrict or promote their use of some tubular flowers enabling certain groups to capitalise on different resources in the same habitat and avoid direct competition. Similarly, for butterflies that are not aposematically coloured, particular flowers may be visited at



more restricted times of the day to avoid predation when the local birds are most actively feeding. The historical accounts of migration (Appendix E) is another fascinating archive, one that reveals that adult butterflies were far more numerous on the island decades ago than they are today. The book closes with a Glossary, the References, and the index of scientific and common names, followed by a short list of abbreviations used in the text.

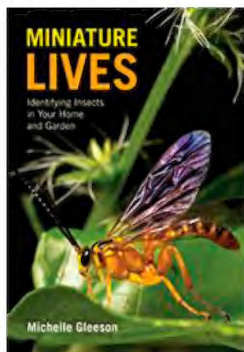
I found just a few imperfections and typographical errors, which I mention only in the tradition of fairness, having done so in previous reviews. The year is missing for the paper by Rocha et al. (listed on p. 408) published in the journal *Science* in 2014, and the acronym NHM (Natural History Museum of London, England) appears after its second usage (p. 4). The scientific name of *Cepora nadina* is incompletely italicised on the final letter of its specific epithet (p.7), and the subfamily name, Limenitinae, is misspelled in an appendix (pp. 353-354). Some have argued since 1995 that the genus *Virachola* is a synonym of *Deudorix*. In addition, the introductory text asserts that the male butterfly carries the female during nuptial flights (p.32) but this applies specifically to the family Pieridae and the nymphaline subfamily Danainae; the female is the consistent carrier in some families and, in certain groups, the favoured carrier may actually vary according to species or within species linked to circumstances. Finally, the Common Nawab referred to as *Charaxes athamas* is likely to be *Polyura bharata*; the status of that genus and species was revised in 2015 (research possibly published after the completion of the manuscript).

Overall, the work is an astonishing accomplishment by a dedicated couple. It stands, without question, as a milestone in the study of the butterflies of this island and more broadly for the South Asian region for which there are few texts to this level of scholarly excellence and scientific detail. I recommend it as an essential addition to the library of those interested in the biology of the butterflies of Asia. I anticipate too, that it will lure much interest from Australian enthusiasts given that 56 (23%) species (and 22 of the remaining genera) from that island also occur in political Australia. Those with an interest in butterfly food plants and their early stages will be delighted with the work's coverage, which exceeds expectations.

Miniature Lives, Identifying Insects in Your Home and Garden by Michelle Gleeson – Reviewed by Jill Fechner

I met Michelle Gleeson when I attended her Bugs Ed information session at the Queensland Garden Expo in 2015. She spoke eloquently of her love for insects. She told her audience she was putting the finishing touches on a book that she hoped would help people to identify and respect the amazing creatures that share our homes and gardens.





Michelle studied to be an entomologist but didn't follow the traditional academic path. Instead, with first-class honours under her belt, she chose to follow her passion for education. Bugs Ed, launched in 2003 with good friends Anthony and Kate Hiller, each year educates children around Queensland about the insect world. In her own words this book is -" a simple, comprehensive, easy-to-read identification guide to Australian insects".

The book informs the reader about what they have found, how it grows, what it eats, how it protects itself and whether it is good or not to have around. It also provides suggested keyword terms to find further information through internet searches. Well set out, beautifully photographed and with an illustrated identification key, Michelle should be very proud of the volume she has produced.

I hope Michelle continues to inspire the entomologists of tomorrow. I couldn't agree more with the wonderful sentiments of Densy Clyne who penned the Foreword. "This book is set to fill an important role, not least in the cause of insect conservation. It will serve as a useful reference work for the serious field entomologist. And hopefully it will help to shatter old prejudices as it introduces new generations to the diverse, secretive, often beautiful and always intriguing minibeasts whose world we so recently came to share."

For more information about Bugs Ed visit <http://www.bugsed.com/>

ISBN: 9781486301379 - Format: Paperback - Number of Pages: 344 -Published: 1st March 2016 - Publisher: CSIRO - Dimensions (cm): 21.5 x 14.8 x 2.3

The book is available from BOIC for a member's price of \$35 (non-members \$40) plus P&H.

REPORTS

Springbrook National Park Field Trip – 15th October, 2016 –

Paul Klicin – Field Trip Co-ordinator

Thanks to everyone that attended the BOIC field trip to Springbrook National Park. As my first official planned outing as BOIC Field Trip Co-ordinator I thought it might be a big ask to expect people to make the drive all the way down to Springbrook from Brisbane, however much to my delight, by 10am we had a 13 strong contingent of like-minded people eager to commence our morning hike into the bush to see what there was to discover within this diverse environment.

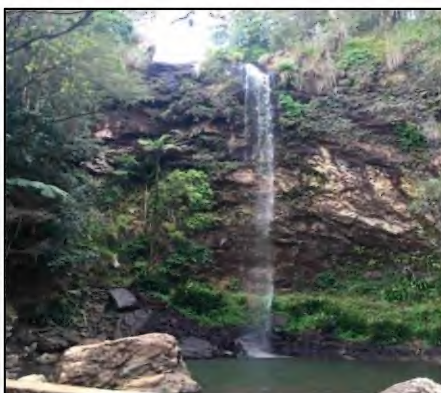
Located in the Gold Coast Hinterland, this protected national park consists of almost 62km² of almost pristine rainforest and is home to numerous species of fauna such as



Albert's Lyrebird (*Menura alberti*), Satin Bower Bird (*Ptilonorhynchus violaceus*), Land Mullet (*Bellatorias major*), Lamington Blue Spiny Crayfish (*Euastacus sulcatus*), Eastern Yellow Robin (*Eopsaltria australis*), Imperial Hairstreak butterfly (*Jalmenus evagoras*) and the Richmond Birdwing butterfly (*Ornithoptera richmondia*) to name just several, and by no means mentioned here in order of significance.

Previous to this outing, I personally visited this same area and was lucky enough to spot several Land Mullet, the Blue Spiny Crayfish and a female Richmond Birdwing butterfly which was at the time laying many eggs on its host plant the coastal Birdwing Vine (*Pararistolochia praevenosa*).

I was a little disappointed that the original planned route for this field trip was closed to the general public due to maintenance of that section of the walking track. Our planned walk was to skirt and overlook the edge of the rainforest en route to a known Richmond Birdwing habitat with a large variety of host plants along the way. Our group quickly committed to an alternate route which took us along a winding trail which descended into the rainforest canopy where we were greeted along the way with magnificent lush rainforest with views of some beautiful waterfalls and massive rainforest trees.



It didn't take our group long to spot a couple of Land Mullet (*Egernia major*, Australia's largest skink and the world's second largest) at the edge of the walking track. It remained still long enough for some of our avid photographers to capture some images.





Club President Frank Jordan was able to deftly identify several butterfly host plants along the way and gave a brief analysis of these plants for all the club members present.

The identified host plants were as follows:
 Hairy Pomaderris (*Pomaderris lanigera*) - host plant for the Yellow Jewel (*Hypochrysops byzos*), Veiny Wilkiea (*Wilkiea huegeliana*) - host plant for the Regent Skipper (*Euschemon rafflesia*), Bolwarra (*Eupomatia laurina*) - host for the Eastern Dusk-flat (*Chaetocneme beata*), Tall Rice Flower (*Pimelea ligustrina*) - host plant for the Yellow-spotted Blue (*Candalides xanthospilos*).

The weather remained clear but, unfortunately, butterfly activity was sparse to say the least which I believe was mainly due to us being out of the sun and beneath the rainforest canopy for most of our journey, and butterflies being creatures of the sun. Butterflies are most commonly seen flying around open sunny areas.

Unfortunately, I was unable to spend much time with everybody and chose to scout ahead as I was not feeling well at the beginning of our walk but I managed to catch up with people afterward for an enjoyable lunch when we returned from our walk. During lunch, we were joined by a couple of Satin Bower Birds, an Eastern Yellow Robin and a Green Catbird (*Ailuroedus crassirostris*) aptly named due to its distinctive call that resembles a cat meowing.



Hairy Pomaderris (*Pomaderris lanigera*) host for the Yellow Jewel (*Hypochrysops byzos*)
 Photo Jill Fechner

Stay tuned for exciting news regarding upcoming field trips in the coming months and we hope to see you along at the next one. Meanwhile.....happy bug hunting

Photos Paul Klicin except where previously credited



Jill Fechner took the following photos on the Springbrook Field Trip



Lending a helping hand



Bracket Fungus (*Trametes versicolor*)



While not host plants for lepidoptera, the following threatened plants are certainly worth a mention.



Helicia ferruginea



Helmholtzia glaberrima

Tamborine Skywalk Field Trip – 12th November, 2016

Paul Klicin – Field Trip Co-ordinator

If you have ever wondered what paradise looks like, just ask any one of the twenty three BOIC members who attended our most recent field trip to the Tamborine Rainforest Skywalk on Saturday the 12th of November.

Nestled amongst a lush green valley on the south eastern corner of Tamborine Mountain is 30 acres of privately owned pristine rainforest that is so rich in flora and fauna species that even the most insatiable wildlife lover and tree hugger will be left humbled by the absolute diversity the area has to offer.

Due to the sheer volume of host plants and animals that were identified on this field trip and as a bit of an experiment I have included all the scientific and botanical names of animals and plants respectively in a separate appendix at the end of this trip report which also makes for easier reading for our grass roots members whilst also satisfying the needs or expectations of our scientific boffins.



Rising approximately 25-30 metres above the rainforest floor we began our walk on the unique and purpose built skywalk platform with the aid of a brief 15-20 minute guided talk from Nick Moore who is the Tamborine Rainforest Skywalk Manager. Nick informed us of a recent and interesting visitor to the Skywalk being Australia's Largest Owl, the 'Powerful Owl', but unfortunately on the day this magnificent bird decided not to present itself. Thanks go to Nick for his valued time.

The Birdwing Vine which is the host plant to the Richmond Birdwing butterfly is in abundance throughout the Rainforest Skywalk and due to habitat loss in various areas along the east coast of Australia an additional 500 plants have been planted in this location over the last year or two with the intention of not only sustaining this butterfly species but to help build upon its numbers, as according to Michael F Braby, the author of 'The Complete Field Guide to Butterflies of Australia (2016)' the Richmond Birdwing butterfly is vulnerable in Queensland and threatened in New South Wales.

As our large group of enthusiasts began to spread out along the walk word began to filter back of confirmed sightings of the male and female Richmond Birdwing butterfly along various locations of the track. One cannot help but watch in awe as this magnificent drawcard butterfly continues about its business flying amongst the rainforest trees in search of nectar food and host plants on which the female lays its precious cargo of eggs. Though not in large numbers patience, and a little bit of luck, was required to spot this popular butterfly. Only the quickest and luckiest of photographers would have been able to capture a photograph of this butterfly and unfortunately none of those were present on this day.



I managed to locate 3 early instar Richmond Birdwing butterfly larvae, most likely no more than one or two weeks old, feeding on the soft new growth of a birdwing vine which was growing beside the walking track and which I pointed out to other members of our group. It's a very fascinating caterpillar which I have always thought to be quite prehistoric looking.



Being such an iconic butterfly of the area, the Richmond Birdwing was a major draw-card for us. However, along our walk we were also greeted with aerial displays from a vast array of other butterfly species such as the White-banded Plane, Blue Tiger, Blue Triangle, Caper Gull, Caper White, Large Grass Yellow, Meadow Argus, Monarch,



Wonder Brown (*Heteronympha mirifica*)
Photo Kathy Clark

Orange Palm Dart, Orchard Swallowtail, Painted Lady, Pale Triangle, Small Grass Yellow, Wonder Brown, White Nymph, and the Yellow Admiral. As you can see, we certainly were spoilt for variety. Unfortunately, apart from the Wonder Brown, no other photographs of these butterflies were presented for our magazine by our print deadline.

I would like to thank John Moss and Frank Jordan for providing valuable input regarding various butterfly host plants that grow in the area along with other interesting non host plant species.

Some of the host plant species identified were the Stinging Nettle (host to the Yellow Admiral et al.), Native Mulberry (host to the Jezebel Nymph et al.), Sandpaper Fig (host to the Purple Moon Beam), Native Grape Vine (host to the Joseph's Coat moth, et al.), ZigZag Vine (host to the Pale Triangle), Birdwing Vine (host to the Richmond Birdwing) and the Wait-a-while (host to the Caper Gull) to name just a few.



Photo Paul Kliein

The first leg of our walk concluded at the edge of the Cedar Creek rock pools and upon arrival I spotted several members of our group scrambling amongst the rocks and pointing cameras this way and that. They had located and identified an interesting day flying moth, *Cruria synopla*, which was easily spooked with the slightest detection of movement by any of us. Fortunately, I managed to photograph this unique looking moth with my iphone.



Of interest, a photograph was captured of a blue damselfly, Whitewater Rockmaster (*Diphlebia lestooides*), resting on a rock by Cedar Creek. Ric Natrass's dragonfly book notes that it was first collected at Cedar Creek on Mt. Tamborine by a gentleman named Fraser in December 1960.



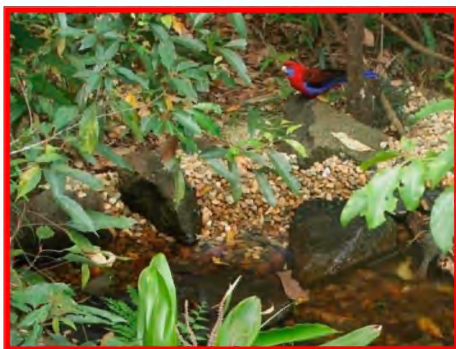
Photo Paul Klicin



Another day flying moth identified on our walk as the Tiger Moth – Photo Paul Klicin



Unidentified ants – Photo Jaap Vogel



Crimson Rosella – Photo Jaap Vogel

After our walk, lunch was a relaxing affair overlooking a small rock pool and slow flowing stream beside the visitor centre and café. According to Nick, this is a favourite drinking and swimming hole for



Regent Bower Bird – Photo Kathy Clark



a variety of local birds. We witnessed, first-hand, two very stunning Regent Bower birds that seemed to be enjoying themselves splashing about in the water. This was followed by the visit of a Crimson Rosella.

This ugly fellow is a Hawk Moth larva (*Theretra latreillei*) gorging itself on a native grape vine, *Cayratia clematidea*, which was growing quite commonly throughout the area. This fine specimen of a caterpillar was found at the edge of the car parking area



Photo: Paul Kliein

outside the visitor centre. (Ed.: Paul, a child once told me that “nothing in nature is ugly”. ☺)

If you missed this trip we are more than likely planning another trip to Tamborine Rainforest Skywalk sometime in the future.

Thanks to everyone that attended and meanwhile, happy bug hunting.

Appendix of common names accompanied by scientific and botanical names

Butterflies (Common name)	Scientific Name	Host Plant (Common name)	Botanical Name
White-banded Plane	<i>Phaedyra shepherdii</i>	Koda	<i>Ehretia acuminata</i>
Blue Tiger	<i>Tirumala hamata</i>	Corky Milk-vine (et al.)	<i>Secamone elliptica</i>
Blue Triangle	<i>Graphium sarpedon</i>	Three-Veined Laurel (et al.)	
Caper Gull	<i>Cepora perimale</i>	Scrambling Caper (et al.)	<i>Capparis sarmentosa</i>
Caper White	<i>Belenois java</i>	Scrub Caper	<i>Capparis arborea</i>
Large Grass Yellow	<i>Eurema hecabe</i>	Breynia (et al.)	<i>Breynia oblongifolia</i>
Meadow Argus	<i>Junonia villida</i>	Crenate Fanflower (et al.)	<i>Scaevola albida</i>
Monarch	<i>Danaus plexippus</i>	Milkweed (et al.)	<i>Asclepias curassavica</i>
Orange Palm Dart	<i>Cephenes augiades</i>	Bangalow Palm	<i>Archontophoenix spp.</i>
Orchard Swallowtail	<i>Papilio aegeus</i>	Sandfly Bush (et al.)	<i>Zieria smithii</i>
Painted Lady	<i>Vanessa kershawi</i>	Paper Daisy (et al.)	<i>Xerochrysum bracteatum</i>
Pale Triangle	<i>Graphium eurypylus</i>	Canary Beech (et al.)	<i>Polyalthia nitidissima</i>
Common Moonbeam	<i>Philiris innotatus</i>	Sandpaper Fig	<i>Ficus coronata</i>
Richmond Birdwing	<i>Ornithoptera richmondia</i>	Birdwing Vine	<i>Pararistolochia praevenosa</i>
Small Grass Yellow	<i>Eurema smilax</i>	Edge Senna (et al.)	<i>Senna acclinis</i>
Wonder Brown	<i>Heteronympha mirifica</i>	Graceful Grass	<i>Ottochloa gracillima</i>
White Nymph	<i>Mynes geoffroyi</i>	Native Mulberry	<i>Pipturus argenteus</i>
Yellow Admiral	<i>Vanessa itea</i>	Stinging Nettle (et al.)	<i>Urtica incisa</i>
Moths			
Cunjevoi Day-Moth	<i>Cruria synopla</i>	Cunjevoi Lily	<i>Alocasia brisbanensis</i>



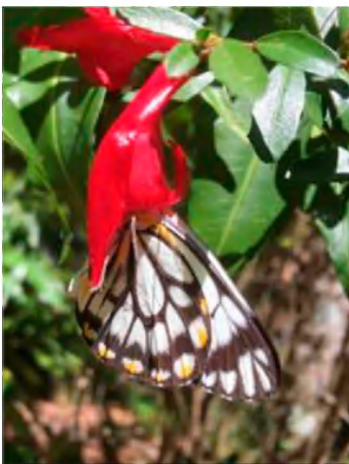
Hawk Moth	<i>Theretra latreillei</i>	Native Grape Vine (et al.)	<i>Ciccus clematidea</i>
Tiger Moth	<i>Amata trigonophora</i>		

IN THE GARDEN

Caper Whites – Peter Hendry



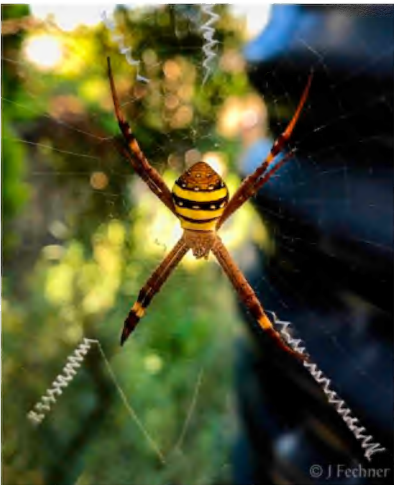
Over the past few weeks I have noticed a few Caper White (*Belenois java*) butterflies in the garden. On Sunday 25/10/2016 there were quite a few nectaring among the Pentas but the numbers exploded on the following day. While nectaring was the prime activity several were seen in courtship displays and males chased each other. While flowers of all colours were visited, the red *Pentas* proved most popular followed by the red flowering *Graptophyllum* sp..



This is the first time I have noticed butterflies nectaring on my *Graptophyllum* which is often visited by the noisy miner (*Manorina melanoccephala*), a bird in the honeyeater family. I wrote an article on the Caper White migrations in BOIC Newsletter No. 47, December 2007.

Photos Peter Hendry

This stunner keeps building right across the tap to my tank. St Andrew's Cross Spider (*Argiope keyserlingi*).



Far left - Lean Lynx Spider (*Oxyopes macilentus*) on *Plectranthus argentatus* - a great plant for native bees.

Photos and text
Jill Fechner



BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

At the time of printing, details of the programme were not available. You will be advised of these via email or post when these are finalised. We do, however, have tentative dates for the following events:

Committee and Planning meeting – February 11th 2017

Field Trips – Ormeau revisited January 7th 2017

Lota Boardwalk February 18th 2017

Bribie Island Butterfly House March 26th 2017

DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Andrew Atkins who provided the cover painting and plates
- Photographers who allowed their images to be reproduced
- Daphne Bowden who works on layout, production and distribution
- Kelvyn Dunn and John Moss for scientific referencing and proof reading of various articles in this issue of the magazine

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